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SOILS OF THE EASTERN UNITED STATES AND THEIR USE—VIII.

THE CLARKSVILLE SILT LOAM.

BY

JAY A. BONSTEEL,
Scientist in Soil Survey.

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MILTON WHITNEY, *Chief of Bureau.*

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SOILS OF THE EASTERN UNITED STATES AND THEIR USE—VIII.

THE CLARKSVILLE SILT LOAM.

GEOGRAPHICAL DISTRIBUTION.

The Clarksville silt loam is one of the most extensive of the upland limestone soils, being exceeded in area only by the Clarksville stony loam. The Clarksville silt loam has been encountered in 15 different soil survey areas, located in 5 States and the total extent of the type already mapped amounts to 1,599,938 acres. It thus constitutes an extensive and important type of soil in the localities where it occurs.

CHARACTERISTICS OF THE SOIL AND SUBSOIL.

The surface soil of the Clarksville silt loam to an average depth of about 8 inches consists of a gray, yellowish-gray or pale-yellow silty loam. In many areas this surface soil is rather compact and dense, but in the better tilled areas it is usually mellow and friable. The immediate subsoil from a depth of 8 or 10 inches usually to a depth of nearly 3 feet is a heavy yellow or reddish-yellow silt loam, which grades downward into a stiff compact silty clay at a depth of 3 feet or slightly more. In some cases the entire 3-foot section is marked by gray or yellow colors, but in the vast majority of areas the deeper subsoil becomes reddish yellow or a deep red in color. In general there is only a small quantity of chert or flint in the surface soil, but in the subsoil there are bands and layers of chert as well as scattered chert fragments, which in many instances notably assist in the subsoil drainage of the type. The deep subsoil usually rests upon the surface of the limestone rock from which the soil is derived by partial solution.

In all cases the Clarksville silt loam is derived from cherty and impure limestones, usually of the Carboniferous age, although practically all of the limestones containing bands, layers, and lenses of chert may give rise to this type, and there are areas where limestone interbedded with thin layers of fine-grained sandstone has also formed the original rock from which the Clarksville silt loam was formed.

The Clarksville silt loam differs from the other members of the same series in possessing a uniform soft silty surface soil, which gradually becomes more dense and compact with increasing depth. The

Clarksville clay loam lacks this surface covering of silt to a large degree, while the Clarksville stony loam is marked by accumulations of stone and chert to such an extent that they form a considerable proportion of both the surface soil and subsoil, not infrequently interfering with cultivation.

The Clarksville silt loam and its associated soils differ from the soils of the Hagerstown series from the fact that they are derived from siliceous and cherty limestones and not from the massive blue and rather pure limestones to which the latter series owes its origin. Moreover in areas where both series occur, the Hagerstown series is uniformly found at the lower levels, occupying valley positions, while the Clarksville series occupies the plateaus and rims around the basins and valleys where the Hagerstown soils are found. The surface soil of the Clarksville silty loam is prevailingly gray or pale yellow in color, while the surface soils of the Hagerstown series are usually brown or deep yellow shading into brown.

SURFACE FEATURES AND DRAINAGE.

The Clarksville silt loam is preeminently an upland or plateau soil and its surface varies from minor areas almost absolutely level to extensive tracts, comprising the main body of the type, which are gently rolling and undulating. Around its margins the Clarksville silt loam also occupies rounded hills of gentle slope, where erosion has not been sufficiently active to destroy the characteristics of the type. In very few instances can the surface configuration of areas of the type be said to be more than sloping.

In western Kentucky and western Tennessee the altitudes attained by the Clarksville silt loam range from about 450 feet to 700 or 800 feet above tide level. Eastward from this region the surface rises gently until altitudes of 1,000 or even of 1,200 feet are attained, where the Highland Rim of eastern Tennessee slopes gradually up to the Cumberland Plateau. West of the Mississippi River, in the Ozark borders, the altitude of the areas occupied by the Clarksville silt loam similarly increases gradually from about 500 feet in the northern and northeastern region to approximately 1,000 feet where the Ozark border abuts against the more central portions of the uplift. In both of these general localities the Clarksville silt loam is found upon the more level tracts at the higher elevations, but not attaining to the highest hills and slopes which are usually occupied by the Clarksville stony loam or some other type of soil. In northern Arkansas the Clarksville silt loam is found upon distinct benches and fragmentary plateau areas at altitudes ranging up to 1,200 or even 1,500 feet above sea level.

In spite of its elevated position and of the fact that deep drainage channels have been cut through the elevated plateau regions occu-

pied by the Clarksville silt loam, its level to gently rolling surface topography renders the internal drainage of the type deficient in many areas. This arises from the fact that the elevated plateau areas, while they may be well drained around their margins, are so extensive that surface drainage has frequently not been well established over the more interior locations of the wider stretches covered by the type. The soft compact silty soil and dense silty loam or silty clay subsoil are rather impervious to the percolation of moisture, thus retarding the effective internal drainage of the soil and subsoil. In many areas where the soil type has been encountered there are sink holes and cavernous subterranean drainage ways which assist materially in the proper drainage of the type. In such areas the agricultural value of the land is frequently greater than in the more level portions where this accessory drainage is lacking.

The level topography of the Clarksville silt loam in general serves to prevent excessive erosion. Near the borders of the type where it breaks down over steeper slopes to the gorgelike valleys, which frequently separate different areas of this soil, erosion is active and in many instances excessive. Owing to the characteristics of the soil and subsoil, however, the true silty loam and silty clay soil is rapidly carried away, leaving an accumulation of the included chert and flint fragments, and this frequently progresses to such an extent that areas of the Clarksville silt loam are rapidly transformed by erosion into areas of the Clarksville stony loam. This arises merely through the removal of the fine-grained soil and subsoil material at a rate more rapid than the rate of disintegration of the stony fragments which thus accumulate to modify the textural characteristics of the soil area.

LIMITATIONS OF USES.

The fine-grained texture and dense structure of the Clarksville silt loam preclude the production of many special crops which are suited to better drained and warmer soils. These same characteristics also render the type well suited to the production of the small grains and certain grasses, while not interfering seriously with the growth of special classes of tree fruits. The Clarksville silt loam, however, because of its texture and structure is a general-purpose farming soil rather than one suited to special crops.

Throughout its entire extent the Clarksville silt loam is usually deficient in the amount of organic matter remaining in the surface soil. This is shown by the rather uniform gray or ashy color of the surface materials, and by the soft powdery texture of the soil, unmodified by the inclusion of fibrous organic matter. This lack of organic matter also gives rise to undue compactness in the surface soil and renders its tillage difficult unless the mechanical handling of the

soil is undertaken when the moisture content is neither too great nor too small. One of the most fundamental requisites for the improvement of crop yields upon this soil and for the extension of its profitable use lies in the addition of organic matter to the surface soil through the employment of stable manures and of green crops plowed under.

Over considerable areas of the Clarksville silt loam tile underdrainage will be requisite, in order to bring the subsoil drainage into condition more favorable for the production of large yields of the staple crops. The efficacy of such drainage is adequately displayed by the crop yields which are reported from areas of the Clarksville silt loam which are underlain at a depth of 24 to 30 inches by a porous layer of broken chert nodules. This layer, which is found extensively in the western Kentucky and western Tennessee counties of which soil surveys have been made, very materially assists in the subsoil drainage of the type, and it is from areas thus underlain that the highest crop yields are habitually reported. If the same efficient underdrainage could be secured through the installation of tile drains in many other areas occupied by the type the increase in crop yields would be sufficient to pay for the total cost of the installation within a brief period after the tile were laid.

To a limited extent, certain areas of the Clarksville silt loam require protection from erosion. In general, however, this is not a serious difficulty with the type except in its marginal portions. The usual methods of allowing the steeper slopes to remain seeded to grass or allowing them to be occupied by forest growth will usually prove adequate. In certain areas where the occupation of all of the area of the type for agricultural purposes is desirable contour farming and terracing may be employed.

One of the greatest difficulties encountered in the management of the Clarksville silt loam is that of plowing and tilling the type when the moisture condition of both surface soil and subsoil is such that the earth may be turned and broken to plow depth without the clodding of the surface soil and the puddling of the subsoil where the plow sole runs over it. If the surface soil be plowed when only a little too moist it is liable to turn over in a long continuous strip of unbroken soil, which later on would naturally be harrowed into compact clods of little value for the production of a crop. When the surface soil is in this condition the subsoil will also be so wet that the passage of the plow over it will compact and harden a layer at plow depth, giving rise to the so-called "hardpan" or plow-sole layer. Land plowed in this condition is not only difficult to handle in all the subsequent tillage operations, but there is also established an impenetrable zone between the surface soil and subsoil through which the roots of the growing crops may not pass. The "hardpan"

also limits the water holding capacity of the soil, and the amount of moisture stored in the surface soil above it is easily evaporated during the earlier stages of crop growth, leaving a scarcity during midsummer and during the ripening period of the grain. Wherever this condition exists the yield of corn, in particular, is decidedly decreased. Wheat is not affected adversely to so great a degree, and as the crop is removed during the early summer, its yields are not usually decreased by this condition to such an extent as are the yields of corn. Great care is, therefore, necessary in the plowing of this type to perform the operation at a time when moisture conditions are favorable in both the surface soil and in the subsoil.

All of the areas of the Clarksville silt loam which are known to exist in the United States occur between latitude 34° and latitude 39° north. Thus the range of climatic surroundings is determined more by altitude than by latitude. In the lower lying areas in western Tennessee and Kentucky and in the lower portion of the Ozark Uplift, the length of season is adequate for the production of practically all the farm crops. In the higher lying portions along the border of the Cumberland Plateau, and immediately adjoining the Ozarks proper the growing season would not be adequate for the production of tobacco and other special crops. Similarly, cotton is little grown upon this soil type, except at its lower altitudes and in the regions of its most southern development in the northern counties of Alabama. Both the ranges of altitude and the latitude within which the type occurs, added to its textural and structural conditions, limit its use to the production of the staple general farming crops.

IMPROVEMENT IN SOIL EFFICIENCY.

There are two principal modifications which constitute the most essential changes to be effected with respect to the Clarksville silt loam for the purpose of increasing its efficiency in crop production. The first of these is the incorporation of a sufficient amount of organic matter to make a complete soil and to render the soft silty compact surface loam more open and friable. Throughout the entire region where the soil type occurs very little live stock is kept, so that the use of the stable manures is not at present possible upon any large scale. These manures, however, should be carefully saved and used upon the ground to be planted to any hoed crop. In order to supplement the use of stable manures, green crops, particularly cowpeas, should be raised in the regular rotation. The pea vines and peas may be harvested and used as a forage crop, while the stubble and roots are plowed in to add organic matter to the soil. It is not infrequently necessary to apply lime to the Clarksville silt loam in order to secure an adequate stand of cowpeas or other leguminous

plant. To some extent the medium red clover is used for grass seeding upon the Clarksville silt loam, and except where this crop is subject to fungous diseases its more extended use is to be recommended. In all cases the Clarksville silt loam should be limed before being seeded to clover.

Another fundamental difficulty with the Clarksville silt loam, already mentioned, is the lack of adequate drainage, particularly in the subsoil. Wherever the general valuation of land of this character through the demand for it for general or special farming purposes has attained to $40 or $50 an acre, it is desirable that the question of tile underdrainage should be carefully considered. This is especially true where the bands of chert do not occur in the subsoil over sufficient areas to assist in loosening and draining that portion of the type. The adequate tile drainage of the fields will normally cost from $12 to $20 an acre, and this should constitute a part of the permanent investment in the land and its improvements. It is only, therefore, where the Clarksville silt loam may be used for the production of special crops like the heavy export tobacco or where the increased yield of corn, wheat, and the grasses may be proved to be sufficient to justify an expenditure of this magnitude that tile drainage is to be recommended. In the more remote areas where land is abundant, it is probable that many years must elapse before tile drainage will be justified by the increases in land values.

The necessity for the use of lime upon this soil in order to secure a satisfactory growth of cowpeas or clover has already been mentioned.

LIMITATIONS UPON SPECIAL CROPS.

The rather heavy character of the surface soil, the dense subsoil, and the considerable altitude at which the Clarksville silt loam normally is found limit its use for the production of special crops with the exception of tobacco in western Tennessee and Kentucky, and of apples in the Arkansas-Missouri region. Special crops have not been found to be profitable over the greater portion of the type. Within recent years, however, certain localities have begun the development of cantaloupe growing and strawberry production, and reasonable success has been attained with both of these crops. Otherwise the inherent characteristics of the soil and its location and natural drainage render it a type better suited to the production of general farm crops than of specialties.

A considerable portion of the Clarksville silt loam thus far encountered by the soil survey has been located upon the higher plateaus surrounding the basin region of Tennessee and the bluegrass region of Kentucky. It occupies what is known as the Highland Rim in Tennessee and extends eastward to higher and higher altitudes until it merges with the Cumberland Plateau. Throughout this region

stream erosion has cut deep gorges and valleys, and in general the Clarksville silt loam lies upon the higher plateaus at altitudes considerably above the lines of through transportation which follow the larger valleys. Thus, many thousands of acres of the type east of the Mississippi River and additional thousands of acres similarly situated in the Ozark border are rather remote from the principal lines of transportation. There are also heavy grades from its upland situation down to the shipping points. The altitude of the type and its remoteness from transportation serve as an additional limitation upon the classes of crops which may be grown most profitably. These limitations do not prevail at the lower lying elevation in the western portion of Kentucky and Tennessee.

EXTENT OF OCCUPATION.

Throughout its extent, both in the Ozark region and east of the Mississippi River, the early settlers found portions of the Clarksville silt loam to be largely in a treeless or prairie condition. Such areas were not infrequently known as the "Barrens." These areas were occupied by fairly good growths of the native grasses, and originally constituted grazing areas used in connection with the tilled soils, either in the valley bottom lands or upon the valley limestone areas. As density of occupation increased, farms were first located upon the treeless tracts of the uplands and in the forest borders adjoining these small prairies. Fair yields of the crops then produced were normally secured, but the lands were not held in as great esteem as the valley lands just mentioned. In the more remote regions this characteristic occupation is still maintained. Thus in northern Alabama, at the higher altitudes in central Tennessee and Kentucky, and throughout the Ozark border considerably less than 50 per cent of the total area of the Clarksville silt loam is now occupied for tillage purposes. Following the agricultural occupation of the region, many areas which were previously covered with grasses or with scattered clumps of trees have become seeded to the hardwood trees and are now occupied by a sparse to medium growth of post, scarlet, and black-jack oaks. Such areas while not used for active farming operations are utilized for the grazing of cattle and hogs, while a considerable revenue is derived from the cutting of railroad crossties. They also furnish some building material and a considerable amount of firewood. In the western Tennessee and Kentucky region, along the boundary between the two States, practically every acre of the lower lying and better drained Clarksville silt loam is occupied for a high class of general farming, with tobacco as the principal money crop. Thus there is a wide variation in the degree of occupation of the different portions of the type, depending largely upon transportation facilities and the accessibility of the areas covered by the Clarksville silt loam.

Over a considerable proportion of the area of the Clarksville silt loam there is no essential topographic reason why the soil should not be tilled aside from its remoteness from the main routes of transportation.

As population becomes more dense, many thousands of acres of this type may be added to the tilled areas of the States where it occurs.

CROP ADAPTATIONS.

Throughout its entire extent in all localities the Clarksville silt loam is largely utilized for the production of corn. There is a great variation in yield, not only between the different regions occupied by the type, but also when the yields of different farms in the same area are compared. It is, therefore, difficult to state average yields for the type or to determine its relative rank as a corn-producing soil. In general, however, the yields are low. In Alabama, Arkansas, and southern Missouri the average yield is probably from 10 to 15 bushels per acre, which is scarcely sufficient to pay for the trouble of planting.

In the western parts of Kentucky and Tennessee the yields vary from 20 to 40 bushels per acre, and corn is one of the important crops produced upon the type. At the higher altitudes in Kentucky and Tennessee the yield again sinks to 12 or 15 bushels per acre. The lower yields in the production of corn are almost always associated with the occurrence of the type at higher altitudes and with the presence of a stiff, retentive subsoil at no great depth beneath the surface. On the other hand the higher yields of western Tennessee and Kentucky are usually associated with the well-drained soil and subsoil, and particularly with the presence of the layers of chert nodules at a depth of about 2 feet in the subsoil. Thus the factors of climatic surroundings and of subsoil drainage largely control the quantity of corn produced upon this type. This arises principally from the fact that while the crop may obtain sufficient moisture during the earlier part of the season, even when grown upon the portions of the type having the most dense and compacted subsoil, it is totally unable to secure an adequate amount of moisture during midsummer and during the ripening stages of the grain. The removal of this fundamental limitation through tile drainage, through plowing the soil to increasingly greater depths, and in certain instances through subsoiling, would greatly improve this soil for the production of corn.

Wheat is an almost universal crop upon the Clarksville silt loam. There is a considerable range in the yields secured in the different sections occupied by the type. In Alabama, Arkansas, and southern Missouri yields of 5 to 12 bushels are normal, while a yield of 15 bushels or more is considered exceptional. The more elevated areas of the type in central Tennessee and Kentucky produce at about the same rate, while the lower lying areas in western Tennessee

and Kentucky give yields of 12 to 20 bushels per acre, and even the latter yield is not infrequently exceeded. Since the winter wheat is harvested before there is any serious difficulty with summer drought, it is better suited to production upon the Clarksville silt loam than is the corn crop. The use of phosphatic fertilizers in connection with wheat growing on the Clarksville silt loam is universally accompanied by a paying increase in the yield.

Oats are generally raised, particularly at the higher altitudes, as a small grain crop. The yields in Arkansas will average about 15 to 20 bushels per acre; in the majority of Kentucky areas from 15 to 25 bushels; and in Tennessee from 20 to 35 bushels upon the general run of the type. Again the western Tennessee and Kentucky areas considerably exceed these yields.

The Clarksville silt loam is one of the most valuable soil types for the production of the dark export tobacco. A large acreage of this soil type is annually planted to tobacco in the western Tennessee and Kentucky counties which border the line between the two States. In fact the Clarksville silt loam is preferred for the production of this tobacco above all other soils of the section. The soil seems to possess the requisite physical and chemical properties; it retains an adequate supply of moisture; and it is sufficiently fertile to give not only good yields, but also the desired texture and quality of leaf. In this general region also the excellent natural drainage assists, both in the preparation and the tillage of the soil and in the production of a uniform even growth. The average yield of tobacco over many thousands of acres in the Clarksville district is uniformly about 800 to 900 pounds per acre. Larger yields are not infrequently produced, but can not be said to be common. The extension of the cultivation of tobacco of this character upon the Clarksville silt loam need only be dependent upon economic conditions.

Cotton is only produced upon the Clarksville silt loam at the lower altitudes in the most southern regions of its occurrence. In northern Alabama the average yield is probably about one-fourth bale per acre, and only a limited acreage is grown. It would scarcely seem desirable to extend this acreage, since better cotton soils under more favorable climatic surroundings are available.

Fruit crops.—In the Ozark region of southern Missouri and northern Arkansas considerable areas of the Clarksville silt loam have been planted to apple orchards during the last 10 or 15 years. In fact, two northwestern counties of Arkansas are said to contain more apple trees than any other similar area in the United States. For the proper establishing of an apple orchard upon the Clarksville silt loam it is necessary to secure a situation in which suitable air drainage prevails and where the water drainage both over the

surface soil and through the soil and subsoil is adequate. In general the best planters take great care to cultivate and till the soil to a considerable depth before the orchard is planted, thus assisting in the drainage and aeration of the area selected for the planting. In this connection cowpeas and clover are frequently used, both before the planting of the orchard and after the trees have been set, to increase the organic matter content of the surface soil and to maintain it in friable and loose condition. Very little other fertilization of the apple orchards is practiced. In this region the Ben Davis is the principal apple planted, constituting probably 75 per cent of all the trees set during the earlier years. This variety is well suited to the soil and climatic conditions, and is also very prolific. More recently the orchard plantings have included a number of other varieties which have shown themselves to be suited to production upon this type of soil. The Arkansas, Arkansas Black, and Gano have been extensively planted. The Red Astrachan is the most important early variety.

Peaches are also grown to some extent upon the Clarksville silt loam, particularly in the Ozark region. The Elberta is the principal variety planted. The soil is not so well suited to peach culture as to apple orcharding, and it is not thought desirable that any large commercial orchards should be located upon this type. Peaches are better suited to the Clarksville stony loam and to other associated types.

In Arkansas, Missouri, and some portions of Tennessee, strawberries constitute a leading small-fruit crop upon the Clarksville silt loam. While the acreage is limited in all of these locations, the profit derived from strawberry culture is considered satisfactory. In general the berries are set out in single rows which later on are permitted to spread to form the matted row. The strawberries are allowed to stand for 4 or 5 years; little fertilizer is used, and the yields are correspondingly low. With better methods of cultivation the yields could be decidedly increased. Only the better drained areas of the Clarksville silt loam should be used for strawberry culture.

The production of cantaloupes upon the Clarksville silt loam has been begun within the past few years in the highland rim portion of central Tennessee. The moderately well drained areas of the type are well suited to the production of the crop, and with heavy fertilization, satisfactory yields and profits are secured. The growing of cantaloupes should be confined as much as possible to those areas of the Clarksville silt loam which possess the deep mellow dark-gray or brown surface soil underlain by the silty loam subsoil, yellow in color at the shallower depths, but becoming tinged with red below. In such areas the natural drainage conditions are fairly

adequate and the cantaloupes are less subject to the injurious effects of fungous diseases.

Only in localities where transportation facilities are adequate should attempts be made to grow these special crops.

FARM EQUIPMENT.

The heavy silty nature of the Clarksville silt loam requires the use of moderately heavy farm teams and tillage tools. With the exception of the tobacco-growing region of western Tennessee and Kentucky this equipment is usually lacking and only light-weight horses and mules and the light turnplow are employed. This, to a large degree, accounts for the small yields of the staple crops secured, since it is impossible properly to stir and aerate the surface soil to any considerable depth with this light equipment. Neither is it possible to turn under heavy crops of green manures in a satisfactory manner without the employment of larger plows and heavier teams.

In the same way the farm buildings over a considerable portion of the type are scarcely up to the standard of high-grade farming. Frequently the barns are mere shelters built of poles and there is practically no provision made for the adequate housing of the small amount of live stock kept. In the tobacco-growing region, however, the equipment of teams, tools, and buildings is far more satisfactory and nearly all of the larger farms are improved with good dwellings, substantial tobacco barns for the fire curing of the crop, and with a good equipment of work stock and tools.

It is evident from a consideration of the variations in effectiveness over the different portions of the area occupied by the Clarksville silt loam, that there still remain great opportunities for the proper development of agriculture upon this type. The factors requisite for this development have been outlined in the present circular. The principal requirements are better drainage for a considerable proportion of the type and the incorporation of organic matter in the surface soil. For this latter purpose the production of cowpeas and of medium red clover should be extended. Lime should be applied to the type to foster the growth of both of these leguminous crops. Probably the greater proportion of the type should be developed for general farming purposes, while areas sufficiently well situated with regard to transportation and with regard to drainage may also be utilized for apple orcharding and the production of strawberries and cantaloupes. Less than 50 per cent of the total area of the Clarksville silt loam is now occupied for any purposes of tillage. The remainder constitutes grazing land and vast areas sparsely timbered, principally to oak and other hardwoods.

SUMMARY.

The Clarksville silt loam is one of the most extensive upland limestone soils, being exceeded in total area only by the Clarksville stony loam—a type of subordinate agricultural value.

The fine silty texture of the surface soil and the stiff and compact nature of the subsoil render the Clarksville silt loam better suited to the production of small grains and grass than to the production of staple crops, with few exceptions.

Corn, wheat, oats, and grass are raised at all altitudes over all portions of the type.

The dark export tobacco of the western Tennessee and Kentucky district is particularly well suited to the better drained areas of the Clarksville silt loam, and satisfactory yields are secured over many thousands of acres of the type. It is the best type for the production of this tobacco in the Kentucky-Tennessee region.

Cotton is only produced at the lower altitudes in the more southern regions where the type occurs, and the extension of its production can scarcely be recommended.

In the Ozark region of southern Missouri and northern Arkansas extensive apple orchard plantings have been made upon areas of the Clarksville silt loam which possess adequate air and water drainage. The Ben Davis is the principal variety used, while several minor varieties are also fairly well suited to the type.

In this same region, and also in central Tennessee, strawberries are coming to be an important crop upon the Clarksville silt loam. In the central Tennessee area also, cantaloupes are grown upon such portions of the type as have a deep friable surface soil and fairly well-drained subsoil.

With the exception of the areas devoted to tobacco growing, or to apple orcharding, the farm equipment used upon the Clarksville silt loam is scarcely adequate to the tillage of such a heavy and compact soil. Drainage and better tillage, together with the incorporation of organic matter and the liming of the soil, would give increased crop yields.

Owing to the dense nature of the subsoil and to a liability of lack of moisture during midsummer, wheat is better suited to this type than corn.

Less than 50 per cent of the entire area of the type is at present under cultivation, the remainder furnishing upland pasture and a supply of oak cross-ties and firewood from the rather sparse forest growth.

Approved.

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *April 25, 1911.*

APPENDIX.

The following table shows the extent of the Clarksville silt loam in the areas surveyed to this time.

In the first column is stated the particular soil survey in which the soil was encountered; in the second column, its extent of development in acres; and in the third column, the volume of Field Operations of the Bureau of Soils in which the report upon the area may be found. Those desiring a detailed description of the soil and of the general conditions which surround it in any particular area may consult these volumes in almost any public library.

Areas of Clarksville silt loam encountered in the soil survey.

Survey.	Area of soil.	Year of publication, Field Operations.
Alabama:	*Acres.*	
Huntsville area[1]	59,520	1903
Lauderdale County	104,320	1905
Arkansas:		
Fayetteville area	90,880	1906
Kentucky:		
Warren County	232,832	1904
Missouri:		
Cooper County	65,024	1909
Crawford County	109,760	1905
Howell County	40,384	1902
Saline County	67,520	1904
Webster County	147,712	1904
Tennessee:		
Coffee County[2]	192,000	1908
Giles County	15,360	1907
Lawrence County	113,664	1904
Montgomery County	233,410	1901
Overton County	78,222	1908
Sumner County	49,280	1909

[1] Mapped as Hagerstown silt loam.

[2] Mapped, in part, as Hillsboro silt loam.

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